REMARKS/ARGUMENTS:

Claims 5 and 25 are amended. Claims 5-12 and 23-33 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present invention relates to a solar cell element with electrodes coated with solder. The present invention also relates to a solar cell module comprising a plurality of solar cell elements connected to one another by means of connection electrodes. (Applicant's specification, at p. 1, lines 7-12).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103:

Claims 5, 6, 23-25, 32, and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki et al. (U.S. Patent No. 6,479,744) in view of Wood et al. (U.S. Patent No. 6,150,717). Applicant respectfully traverses this rejection as to amended claim 5. Claim 5, as amended, is as follows:

> A method for producing a solar cell module comprising:
>
> a step for providing a plurality of solar cell elements each having a front surface electrode formed on a light-receiving surface of a semiconductor substrate thereof, and a back surface electrode formed on a non-light receiving surface of the semiconductor substrate;
>
> a step for connecting a first connection tab and the front surface electrode of one of the solar cell elements, by melting a first solder layer that is disposed therebetween;
>
> a step for connecting a second connection tab and the back surface electrode of another of the solar cell elements, by melting a second solder layer that is disposed therebetween and has a different melting point than the first solder layer; and

a step for connecting the first connection tab and the second connection tab.

Applicant respectfully submits that the cited references cannot render claim 5 obvious, because the cited references fail to teach or suggest "a step for connecting a first connection tab and the front surface electrode of one of the solar cell elements, by melting a first solder layer that is disposed therebetween; a step for connecting a second connection tab and the back surface electrode of another of the solar cell elements, by melting a second solder layer that is disposed therebetween and has a different melting point than the first solder layer; and a step for connecting the first connection tab and the second connection tab."

The Office at p. 3, lines 3-8 of the Office Action states that Tsuzuki

> "further discloses the step/process of connecting (col. 7, lines 1-10) a first connection tabs to the front surface electrode of the one of the solar elements by way of a solder connection and then connecting a second connection tab to the back of the surface electron of another solar cell element by way of soldering."

Applicant respectfully disagrees. Tsuzuki merely teaches a connection by way of solder for connecting one end and another end of a single connection tab 104 to a front surface of one solar cell and to a back surface of another solar cell, respectively (Tsuzuki, column 7, lines 1-11).

Tsuzuki is silent as to an arrangement for using two connection tabs, as is required for the present invention (See e.g., connection tab 17 and connection tab 19 in Fig. 2C of present application).

Furthermore, Tsuzuki only teaches a connection by way of solder on a back surface of a solar cell (Tsuzuki, column 3, lines 14-15; column 16, lines 30-35); and Tsuzuki fails to teach or suggest a solder connection for use in a connection tab for connecting in the front surface of the solar cell.

In addition, the Office at p. 3, lines 8-12 of the Office Action states that Tsuzuki

> "further discloses a step for connecting the first connection tab to the second connection tab."

Applicant respectfully disagrees. As discussed above, Tsuzuki fails to teach or suggest a connection by using two connection tabs. Therefore, a step for connecting a first and a second connection tab is absent from Tsuzuki.

Tsuzuki merely teaches at column 3, lines 29-37, that one end of the terminal member 403 connected with the collector electrode 402 on a surface side of a solar cell is put around to the backside of an adjoining solar cell and connected thereto by soldering. Thus, in Tsuzuki, only one terminal member 403 is disclosed.

Furthermore, the Office at p. 4, lines 3-7 states,

> "It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate two different solders with different melting points as taught by Wood et al. to the method of producing a solar cell module of Tsuzuki et al. in order to aid in the assembly of the semiconductor module with two different electrode materials that needs two different sold materials."

Applicant respectfully disagrees. Neither Tsuzuki nor Wood teach or suggest that there is a need for two different electrode materials that need two different solder materials. Consequently, the necessary suggestion or motivation is not disclosed in the cited references.

Furthermore, an analysis of Tsuzuki and Wood reveals that the solders of the cited references are technically different from one another and there would be no reason for a person of ordinary skill in the art to combine the two references.

Tsuzuki teaches a photovoltaic device module in which neighboring photovoltaic devices are connected with a metal member. Specifically, Tsuzuki teaches a method of producing a photovoltaic device module by soldering a bus bar on a front surface of the photovoltaic device to a metal member with a solder

(surface solder), and soldering a bus bar on a back surface of another photovoltaic device to that metal member with a solder (back solder). (Tsuzuki, column 6, lines 18-29).

Wood teaches a method of producing a multichip module which connects a plurality of DDC dice to a support substrate. Specifically, a solder bump 12M having a high melting temperature provided on a DDC dice 10M and a solder bump 96 having a low melting temperature provided on a supporting substrate 94 are connected by solder to fix the DDC dice 10M to the supporting substrate 94 (Wood, column 8, line 62-column 9, line 22; Figures 11-11E).

However, Wood's invention is to form a single solder connection structure by using the bump 12M having a high melting point and the bump 96 of a low melting point, wherein the bump 12M realizes a structural rigidity to prevent the DDC dice 10M from collapsing on the supporting substrate 94. (Wood, column 9, line 62-column 10, line 12). Apparently, the Office believes the structure formed with the two bumps (12M and 96) connected together is considered to be said "surface solder" or said "back solder" of Tsuzuki.

Applicant respectfully disagrees. Based on the above analysis, Applicant respectfully submits that the present invention is not obvious from Tsuzuki which teaches a photovoltaic module to transform light to electricity, in view of Wood, because Wood teaches a multichip module in a different field where a plurality of dice are mounted on a single supporting substrate.

Moreover, in Tsuzuki's structure, the surface solder and the back surface solder are both melted and contribute to the solder connection. In contrast, in Wood's structure, the bump 12M with a high melting point is never melted in the process. In view of these points, the solders of the cited references are technically different from one another, and a person of ordinary skill in the art would not be motivated to combine the two teachings.

Furthermore, if Wood's teachings were to be applied to those of Tsuzuki, it is assumed that a photovoltaic device produced by a step of connecting a metal member to a bus bar on a surface of one of the devices where two surface solder bumps of different melting points are used, and/or by a step of connecting the metal member to a bus bar on a back surface side of another of the device where two back surface solder bumps of deferent melting points are used, results in a different invention for a method for producing a photovoltaic device module.

In light of the foregoing, Applicant respectfully submits that the cited references cannot render claim 5 obvious, because the cited references fail to teach or suggest each and every claim limitation. Claims 6, 23, and 24 depend from claim 5 and cannot be rendered obvious for at least the same reasons as claim 5. Withdrawal of this rejection is thus respectfully requested.

Independent claim 25 and its dependent claims 32 and 33 are similarly directed to a method that requires "a step for connecting a first connection tab and the front surface electrode or the back surface electrode of the solar cell element, by melting a first solder layer that is disposed therebetween; and a step for connecting a second connection tab and an electrode of the solar cell element to which the first connection tab is not connected, by melting the second solder layer that is disposed therebetween and has a lower melting point than the first solder layer, after performing the above step for connecting the first connection tab"; and are therefore, patentable over the cited references for reasons discussed. Withdrawal of this rejection is thus respectfully requested.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 6 above, and in further view of Nakahara et al. (JP 2002/346788). Claim 26 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 25 above, and in further view of Nakahara. Applicant respectfully traverses these rejections.

Claims 7 and 26 depend from claims 5 and 25, respectively; and therefore, cannot be rendered obvious over Tsuzuki and Wood for at least the same reasons discussed above. Nakahara cannot remedy the defect of Tsuzuki and Wood and is not relied upon by the Office for such. Instead, the Office cites Nakahara for teaching a lead-free, Sn-Ag based solder alloy that is an environmentally sound alternative to Pb-based solder while providing high joint dependability.

In light of the foregoing, Applicant respectfully submits that the cited references cannot render claims 7 and 26 obvious, because the cited references fail to teach or suggest each and every claim limitation. Withdrawal of this rejection is thus respectfully requested.

Claims 8-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 5 above, and in further view of Okada et al. (U.S. Patent No. 6,571,469). Claims 27-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 25 above, and in further view of Okada. Applicant respectfully traverses these rejections.

Claims 8-10 and 27-29 depend from claims 5 and 25, respectively; and therefore, cannot be rendered obvious over Tsuzuki and Wood for at least the same reasons discussed above. Okada cannot remedy the defect of Tsuzuki and Wood and is not relied upon by the Office for such. Instead, the Office cites Okada for teaching a soldering method for the manufacture of a modular board with multiple electrodes.

In light of the foregoing, Applicant respectfully submits that the cited references cannot render claims 8-10 and 27-29 obvious, because the cited references fail to teach or suggest each and every claim limitation. Withdrawal of this rejection is thus respectfully requested.

Claims 11-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 5 above, and in further view of

Mizukami et al. (U.S. Patent No. 6,369,315) and Okada. Claims 30-31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuzuki and Wood as applied to claim 25 above, and in further view of Mizukami and Okada. Applicant respectfully traverses these rejections.

Claims 11-12 and 30-31 depend from claims 5 and 25, respectively; and therefore, cannot be rendered obvious over Tsuzuki, Wood, and Okada for at least the same reasons discussed above. Mizukami cannot remedy the defect of Tsuzuki, Wood, and Okada and is not relied upon by the Office for such. Instead, the Office cites Mizukami for teaching a power generation system specifically for use with an array of photovoltaic modules. The Office further cites Mizukami for teaching connecting the photovoltaic array via bus bars and the bus bars contain extensions that are connected directly to "an output fetching line" via a terminal box.

In light of the foregoing, Applicant respectfully submits that the cited references cannot render claims 11-12 and 30-31 obvious, because the cited references fail to teach or suggest each and every claim limitation. Withdrawal of these rejections is thus respectfully requested.

Applicant believes the foregoing amendments comply with requirements of form and thus may be admitted under 37 C.F.R. § 1.116(b). Alternatively, if these amendments are deemed to touch the merits, admission is requested under 37 C.F.R. § 1.116(c). In this connection, these amendments were not earlier presented because they are in response to the matters pointed out for the first time in the Final Office Action.

Lastly, admission is requested under 37 C.F.R. § 1.116(b) as presenting rejected claims in better form for consideration on appeal.

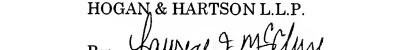
In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4600 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: January 16, 2008

By: 
Lawrence J. McClure
Registration No. 44,228
Attorney for Applicant(s)

1999 Avenue of the Stars, Suite 1400
Los Angeles, California 90067
Phone: 310-785-4600
Fax: 310-785-4601